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The Bailey Hortorium, its Past and Present

George H. M. Lawrence

The name of the Bailey Hortorium is known to thousands of persons. Its offices, collections, and library are known to hundreds. Its staff members and their scientific work are as well known by scientists abroad as by those in this country. Yet, the average American horticulturist knows surprisingly little about the Liberty Hyde Bailey Hortorium, its organization, its research program, its services, or its service potential. Why are these not generally known? Probably it is because its staff is of scientists, and like so many of this fraternity - the botanical perhaps more than all others - its members have been reluctant to publicize themselves lest the limits of good taste and propriety be breached, an inhibition not so notable among the physical scientists or even those in the field of medicine. Considered from the horticulturist's standpoint, this modesty may be unbecoming.

The Hortorium is the outgrowth of a lifetime of work by Liberty Hyde Bailey. While its date of founding is cited as 1935, at which time he gave it formally to Cornell University, it became an institution in the early 1920's, following his return from an extended collecting trip in central China. The earliest collections made by Dr. Bailey and now in the herbarium date from 1881, collections he made of Michigan's native plants, preserved and added to over the intervening decades.

At the time of its transfer to Cornell, Dr. Bailey's gift consisted of a collection of 125,000 herbarium specimens, largely of his own making, and then probably the largest private herbarium anywhere; a library of about 2,700 volumes, exceedingly rich in early horticultural and agricultural works and including basic taxonomic references and floras of the world; a brick building (converted and modernized from a stable, carriage house and coachman's quarters) attached to his residence, and an adjoining garden space. No endowment of funds was involved. This was its beginning.

When the terms of the gift were readied for acceptance, Cornell's President Farrand told Dr. Bailey, "We will name this the Liberty Hyde Bailey Herbarium."

Fig. 1. The "office" of the Hortorium's former quarters adjoining Dr. Bailey's home, the passage to which is seen at the left, rear. One of Dr. Bailey's own favorite working areas was the desk just right of center, toward the rear.

"If you do," retorted Bailey, with characteristic bluntness, "I shall not give it to you."

"What would you have us call it, then?" President Farrand countered, somewhat nonplussed.

"Call it an Hortorium," said Bailey.

"An Hortorium?" queried the President. "Where did you get that word?"

"I just coined it," said Dr. Bailey. "It comes from 'Hortus,' the Latin for 'garden.' It is a repository for things of the garden. It is to be a place for the scientific study of the plants of the garden - their documentation, their classification, and their naming. That is what my wife and I are giving you. Not just an herbarium!"

By a garden he meant any place where man grows plants. It may be a wheat field, a conservatory, an orchard, a bed of flowers, or a pot of pansies. It was thus that the name and concept of an Hortorium came into being. At present there is only one, and it bears the name of Liberty Hyde Bailey.

The Hortorium was accepted by Cornell University very largely because of the confidence placed in Dr. Bailey by the Provost of the institution, who had been its former Dean of the College of Agriculture, a student of Dr. Bailey's, and Secretary of the College Faculty when Bailey was its Dean. This was Albert R. Mann, for whom was named the library building in which the Hortorium's principal offices are now situated. Provost Mann, an astute scholar and keen administrator, recognized a future for the institution now named the Hortorium. Without his support, it probably would never have survived as a separate institution. As early as 1930, while it was yet a private enterprise, he allocated funds for the publication of its periodical, "Gentes Herbarum" (occasional technical papers about the kinds of cultivated plants), which had been founded and named by Bailey in 1920 and financed by him as a private botanical journal, distributed without charge to botanical centers throughout the world.

Although it belongs to the University, the Hortorium has been and still is supported solely by funds made available to it by the Administration of the New York State College of Agriculture at Cornell. For the most part, its total annual budget of about $50,000 comes from College income received from fees and tuitions paid by out-of-state students. Its growth as an institution has been due very largely to the recognition by the College Administration of its place as a truly unique botanical center for research and service in the field of agriculture and, more especially, of horticulture.

Fig. 2. Part of the main herbarium- and work-room in the Hortorium's original quarters. The herbarium specimens were stored in a variety of cases and boxes, only a few of which were standard metal floor-cases.

The physical facilities of the Hortorium, while allowing little room for expansion, are excellent. It eventually outgrew the original building adjoining Dr. Bailey's residence. When it moved from there in 1952 to the fourth floor of the new A. R. Mann Library, it lost some of its atmosphere of informality, of family-tie, and, of course, the association with the physical surroundings in which it originated. No longer could one hear the ring of the cow-bell of Dr. Bailey's boyhood when a major manuscript or book was finished, no longer could one hear a devoted daughter affectionately call to her father, "Tommy, the telephone!" No longer could one work for days on end without interruption. And no longer could one enjoy a lapful of cat, or would one have to be alert to keep papers free of pussy's footprints. With that move from unpretentious but homey and comfortable quarters to modern offices and laboratories with all their ample equipment, a new Hortorium displaced the old. It was a mark of progress, but the nostalgia has not entirely disappeared.

The staff of the Hortorium is composed of botanists trained as plant taxonomists. That is, each is a specialist in plant classification, identification, and nomenclature. The literature and the methods of approach used in resolving these problems are botanical, the subjects with which we work are horticultural. The basic difference between the identifying of a cultivated and a wild plant is that one generally knows from what region the wild plant comes, and, knowing this, one can consult a botanical work on the plants of that particular geographical area. One does not often know the origin of plants of the garden. Therefore, each staff member must become thoroughly conversant with the floras and literature, not only of the United States, or of North America, but of the world, and he must recognize a large number of families and genera on sight.

It happens that it was this very situation that guided me to Cornell. At one time I was growing as many kinds of rock garden plants as I could. Once, when I could not identify some thrifts (Armeria), I brought specimens to the late Professor Fernald at Harvard, for him to name. After I naively admitted to him that they came from the garden, he replied tartly, "Cultivated rubbish. Send them to Bailey!" Thus, my interests brought me to Cornell, made better known to horticulturists by L. H. Bailey.

Dr. Moore of this staff is a graduate of the University of Massachusetts and took his doctorate degree under Professor Fernald at Harvard. Dr. Dress majored in classical languages and English at the University of Buffalo, and took his doctorate in botany here at Cornell. Mr. DeWolf is also a graduate of the University of Massachusetts, with advanced degrees in botany from Tulane University and the University of Singapore. Miss Ethel Bailey, co-editor of "Hortus Second," editor of "Hortus III," and Curator of our collections, is a Smith College graduate. This staff of five is small in number, but the research and service potential of the Hortorium as an institution is great.

Fig. 3. Miss Ethel Z. Bailey at work, mounting herbarium specimens, in a second-floor work-room of the Hortorium's original building, which was once a carriage-house.

Since the early years of the Hortorium as a unit of the University, Dr. Bailey championed the superiority of scientific illustrations from the pen of a trained botanical artist over photographs of the same plant material. There has been a full time illustrator on our staff since 1937; the present, and third to hold the position, is Miss Mitsu Nakayama, whose monogram with its oriental character has graced most of the illustrations that have appeared in "Baileya." Her predecessor, Marion Ruff, became Mrs. Sheehan and left the Hortorium when her husband, Dr. Thomas Sheehan, took a position as Extension Horticulturist at the University of Florida. Fortunately for the Hortorium, Mrs. Sheehan is able to continue to prepare plates for the projected new edition of the Cyclopedia.

With the passing of Liberty Hyde Bailey, the Hortorium has assumed the responsibility of ensuring continuity of three of his great works by means of new editions:

"Hortus Second," the next edition to be "Hortus III";

the "Manual of Cultivated Plants," of which the latest edition was published in 1949;

and the "Standard Cyclopedia of Horticulture," of which the preparation of a new edition will follow completion of "Hortus III."

The production of each of these new editions is a major project. The story of "Hortus III" will appear in a later issue of "Baileya." It is sufficient to say here that each edition is a rewritten work, based on careful investigation of recent and early literature from many lands and in many languages, and on the studies of the plants themselves. These Hortorium publications are highly specialized reference works. Every effort is made to ensure their accuracy and completeness. It is doubtful whether any other American institution has the staff and facilities to take over their preparation.

In addition to these accomplishments, horticultural monographs have been prepared in the past and will continue. The last, by Dr. Bailey, published a few months before his death, was "The Garden of Bellflowers," a combined botanical and horticultural account, abundantly illustrated and with keys for the identification of genera and species, covering those campanulas and their relatives grown in North America. Hours before Dr. Moore sailed last October for a year's study in Europe, he delivered to the publisher the manuscript of an illustrated handbook of the cultivated Gesneriaceæ - the gloxinias, achimenes, episcias, African-violets, and their kin.

The preparation of these standard reference works requires a great amount of research, and this research is based mainly on the several large collections at the Hortorium. These now number nearly 300,000 herbarium specimens, a library of over 6,000 volumes (adjunctive to the rich collection of botanical and horticul-

Fig. 4. Dr. Lawrence, Miss Bailey, and Mr. DeWolf at work in the main herbarium-room of the present quarters of the Bailey Hortorium, on the fourth floor of the Albert R. Mann Library, at Cornell.

tural literature in the two large general libraries at Cornell University), one of the three largest world-wide nursery and seed catalogue collections of the world, and a master card index of all current catalogues. While these collections are the basic "working tools" of the staff, they also enable us to provide individual services to plantsmen. The extent to which these services are available is limited only by the size of our staff. Such services include those listed below.

Identification of common and rare plants, and provision of the correct names of plants.

Sources, in many countries, where a particular plant, or its seed, may be bought. The Hortorium's master card index of its catalogues provides the most complete record anywhere of who has what, and when.

Information as to the source of the first description given a plant, of the name of the man who described or discovered it, or of the person in whose memory it may have been named.

Information on what books and what magazines, from all parts of the world, are to be had about particular plants or special groups of plants. The only bibliography of horticultural periodicals of the world was published by the Hortorium in 1955. Other bibliographies are planned for the future.

Information on the ways by which related kinds of plants may be distinguished, one from another.

For the future, there is proposed an editing service for seedsmen and nurserymen who might wish to ensure correct usage of names in their catalogues and literature.

Liberty Hyde Bailey, had he lived, would have been ninety-eight years old on March 15th. Recognizing the manifold contributions he made to horticulture, culminating in his establishing and giving to Cornell this Hortorium bearing his name, the University Trustees have authorized the establishment of a Liberty Hyde Bailey Memorial, to be a fund of $500,000. This fund is to provide an endowment for the Bailey Hortorium, the income to be used to increase the personnel and thus increase its services to horticulture. Announcement of the project was made on this ninety-eighth anniversary of the birth of Dr. Bailey. The fund is to be raised by contributions, primarily from three sources: former students and friends of Dr. Bailey; the memberships of American horticultural organizations; and friends of the Bailey Hortorium. Voluntary contributions may be sent to the Bailey Hortorium, payable to Cornell University. From time to time, readers of "Baileya" will be advised of progress in development of the Memorial, because on its success surely depends the future of this institution.

A Cytotaxonomic Study Projected for Lilium

Richard W. Lighty
Department of Plant Breeding
Cornell University

Recognizing that many readers of "Baileya" both in America and abroad are lily specialists, I am taking this opportunity to tell you of a new research project now under way here at Cornell, and in which some of you may be able to help me.

A study is being undertaken in order to obtain information which will either support the present classification of the genus Lilium, or indicate the need for its revision. This project is a cytological study of the chromosome behavior in the species of Lilium to determine the relative proportions of blocks or zones of homologous genes in the chromosomes of interspecific hybrids. These observations will be made of stages in the meiotic divisions of the pollen mother cells (at the time the homologous chromosomes pair), the material being taken from very young anthers.

The degree of chromosome pairing, and the general irregularity of the behavior of these chromosomes at the time of pairing and dividing, are considered fairly accurate criteria for the evaluation of closeness of relationship between species of a genus.

The plan involves crossing species in all possible combinations and making cytological examinations of the progeny. The species have been selected on the basis of a large number of morphological characters and their geographic distribution, so as to have, as nearly as possible, a representative sample of the genus. It is hoped that the study will bring to light any changes which have taken place in the chromosomal complement, or karyotype, during the evolution of the species. If enough species are investigated, this should indicate paths and sequences of evolution. This information, when correlated with morphological and distributional data, may provide a basis for a revised classification of the genus.

As a supplementary study, the karyotypes of those species which are available and have not been examined will be determined.

It is desirable to use material identical with that found in the wild. Information is needed which will lead to a source of material of any of the species listed below and which is known to have been collected, or derived from material collected, in its native habitat. In order that the findings may have the greatest reliability, they should be based on "pure" material of species and varieties, that

is, plants whose germ plasm has not been contaminated by hybridization. Data taken from plants collected in the wild, therefore, have the most value, but if it is known that a particular culture of a lily species has been propagated vegetatively (e. g., by scales or bulbils) from material originally introduced from its native habitat, or grown from seed collected from wild plants, then it is equally acceptable.

Please advise me at the Department of Plant Breeding, Cornell University, of material you may wish to contribute to this study. Species of which material (seeds or bulbs) from native sources is especially desired include:

L. amabile
L. auratum
L. Brownii
L. bulbiferum
L. canadense
L. candidum
L. Catesbaei
L. cernuum
L. chalcedonicum
L. concolor
L. dauricum
L. Davidii
L. distichum
L. formosanum
L. Hansonii
L. Henryi
L. Humboldtii
L. japonicum
L. Kesselringianum
L. lankongense
L. longiflorum
L. Macklinіæ
L. × maculatum
L. Martagon
L. medeoloides
L. monadelphum
L. neilgherrense
L. nepalense
L. nobilissimum
L. papilliferum
L. pardalinum
L. philadelphicum
L. philippinense
L. polyphyllum
L. pomponium
L. ponticum
L. pumilum
L. pyrenaicum
L. regale
L. rubellum
L. speciosum
L. Szovitsianum
L. taliense
L. tigrinum
L. tsingtauense
L. Wallichianum

If any study is being made of the genus Lilium along similar lines and with similar objectives, I would appreciate information about it.

ERRATA, VOLUME 3

Page 52, line 1 of legend: for "L. pedunculata, leaf" read "L. pedunculata, petaloid bract from top of inflorescence."
Page 62, line 27: for "Maculine" read "Masculine."
Page 102, line 2 of legend: for "Dracocephalum moldavicum" read "Dracocephalum Moldavica."
Page 132, line 20: for "Brown" read "Baker."
Page 149, line 15: for "Chemæmoly" read "Chamæmoly."
Page 152, line 41: for "volatile and" read "nonvolatile but."

Fig. 5. A, Datura Stramonium. B, Datura ferox.

Notes on Cultivated Solanaceæ
2. Datura

Gordon P. DeWolf, Jr.

It is always pleasant, when trying to identify material, to find a usable, modern taxonomic treatment. Only too often one finds that the most recent monographic treatment of any group, genus, or family, is over 100 years old. For instance, the last comprehensive treatment of the Labiatæ (mint family) was published in 1848, of the Solanaceæ (potato family) in 1852.

In 1921 W. E. Safford, late of the U. S. National Museum, published a "Synopsis of the Genus Datura." In the same year, in the "Report of the Smithsonian Institution," he published a second contribution entitled "Narcotic Daturas of the Old and New Worlds..." While the first article contains keys, limited synonymy, descriptions of new species, and various comments on the species, and the second a running commentary on the more interesting, primarily economic, aspects of the various species, neither singly nor together can these be considered "monographic" in scope. However, since the known valid species are accounted for in the keys and the nomenclatural confusion surrounding several species is effectively cleared up, it is surprising that this treatment is not more widely followed.

In working over the cultivated species for "Hortus III" I have noticed discrepancies and inaccuracies in the nomenclature of certain species. These are discussed below. In addition there is a general discussion of the genus, as well as a key to the cultivated species.

It might be noted in passing that sectional characters in the genus reside in the duration of the plants and in the attitude of the flower and fruit. Specific characters are found in the persistence, shape, and lobation of the calyx, lobation of the corolla, and shape and armature of the fruit. Particularly in the annual and perennial herbaceous species is positive identification dependent on knowing the character of the lobation of the flowers and the armature and attitude of the fruit.

Fig. 6. Datura Metel.

Apparently all or nearly all of the species of Datura produce alkaloids of one sort or another. All parts of the plants are poisonous when taken in quantity, and small doses have strong narcotic effects. The seeds are said to be particularly virulent. At present the leaves are official in the U. S. Pharmacopoea. The effects of the preparations from them resemble those of belladonna, and they are used for the same purposes, i.e., the relief of muscular spasms.

Key to the Cultivated Species of Datura

1. Flowers pendulous (figs. 8, 9, 10, 11), fruit unarmed (figs. 8, 9); shrubs or small trees.
   2. Calyx spathe-like, the single lobe with a horn-like apex (figs. 8, 9, 11).
      3. Corollas white.
         4. Calyx persistent, surrounding the mature fruit; limb of corolla not emarginate between the lobes (fig. 9). . . . . D. candida (Persoon) Safford
         4. Calyx completely deciduous; limb of corolla emarginate between the lobes (fig. 8). . . . . D. arborea Linnæus
      3. Corollas reddish. . . . . D. Rosei Safford
   2. Calyx tubular, with 2 or more distinct teeth (fig. 10).
      5. Calyx persistent; fruit ovoid; flowers reddish. . . . . D. sanguinea Ruiz and Pavon
      5. Calyx completely deciduous; fruit fusiform; flowers white. . . . . D. suaveolens Humboldt and Bonpland
1. Flowers erect (figs. 5A, 6, 7), fruit usually armed (figs. 5A and B, 6, 7); annual or perennial herbs.
   6. Fruit deflexed (figs. 6, 7).
      7. Calyx spathe-like, split down one side, circumscissally dehiscent and deciduous; corolla-limb 10-toothed; stamens exserted; fruit deflexed, unarmed. . . . . D. ceratocaula Ortega
      7. Calyx not spathe-like, generally 5-toothed (figs. 6, 7); stamens not exserted.
         8. Fruit armed with tubercles or short, broad spines; corolla with 5-lobed limb (fig. 6). . . . . D. Metel Linnæus
         8. Fruit armed with long slender spines (fig. 7).
            9. Corolla-limb with 5 distinct lobes. . . . . D. meteloides Dunal
            9. Corolla-limb with 10 distinct lobes (fig. 7). . . . D. innoxia Miller
   6. Fruit erect (fig. 5A and B).
      10. Fruit armed with many spines (fig. 5A). . . . . D. Stramonium Linnæus
      10. Fruit armed with a few coarse, heavy spines, the upper-most markedly longer (fig. 5B). . . . . D. ferox Linnæus

Fig. 7. Datura innoxia.

The generic name Datura is a latinization, which was not original with Linnæus, of one of the Indian vernacular names, "dhatura" or "dhutura," for the southern Asiatic species, Datura Metel. In the "Critica Botanica," a text in which Linnæus sets forth the principles of his system, the origin of the name is given as follows (as translated by Sir Arthur Hort):

> ....I retain barbarous names when I can obtain a root suggesting a possible derivation from Latin or Greek, in which case such names have the value for me of new coinages, e.g., Datura from Latin dare 'to give ' because it is 'given' to those whose sexual powers are weak or enfeebled...

It might be noted, however, that as early as 1790-94 the use of Datura as an aphrodisiac was not mentioned by William Woodville in his "Medical Botany."

In the "Species Plantarum" of 1753, Linnæus listed 3 species. Safford, in his "Synopsis," accounted for 24, of which we have records of 9 or 10 in cultivation.

Of the three species originally mentioned by Linnæus, the first is Datura Stramonium (fig. 5A), the Jimson or Jamestown weed, so-called from its prevalence around that early Virginia settlement. It is the species quite commonly referred to as "Stramonium" by the herbalists. Though this species was in Europe before 1600, there seems to be little doubt that it is, indeed, a native of the western hemisphere. Linnæus commented in 1753, "Native in America, now common throughout Europe."

Datura Stramonium has a distinguished place in the annals of genetic experimentation. A great many races have been discovered in the wild and/or produced under cultivation, varying in such characters as the spinosity of the fruits, color of the flowers, general habit, number of chromosomes, etc. Study of these differences has led to a better understanding of inheritance in other organisms.

Jimson weed is an annual plant, coming readily from seed. In India it is reported to prefer a calcareous soil. In rich soil it will reach 1.5 m. in height. The leaves are ovate in outline, coarsely and irregularly toothed or lobed, reaching 20 cm. in length and 12 cm. in width. They are generally glabrous, sometimes glabrescent. The flowers are borne singly, the dingy-white or purplish corolla being up to 10 cm. long, the calyx somewhat less than half that length, circumscissally dehiscent. Under cultivation, yields of 1,000 - 1,500 lbs. of leaves and about 700 lbs. of seed per acre have been reported.

Datura Stramonium and D. ferox (fig. 5B) are the only two species in cultivation with the seed capsules erect at maturity. These two species are best distinguished by the spines of the fruits, those of D. Stramonium being subequal in length, many in number and

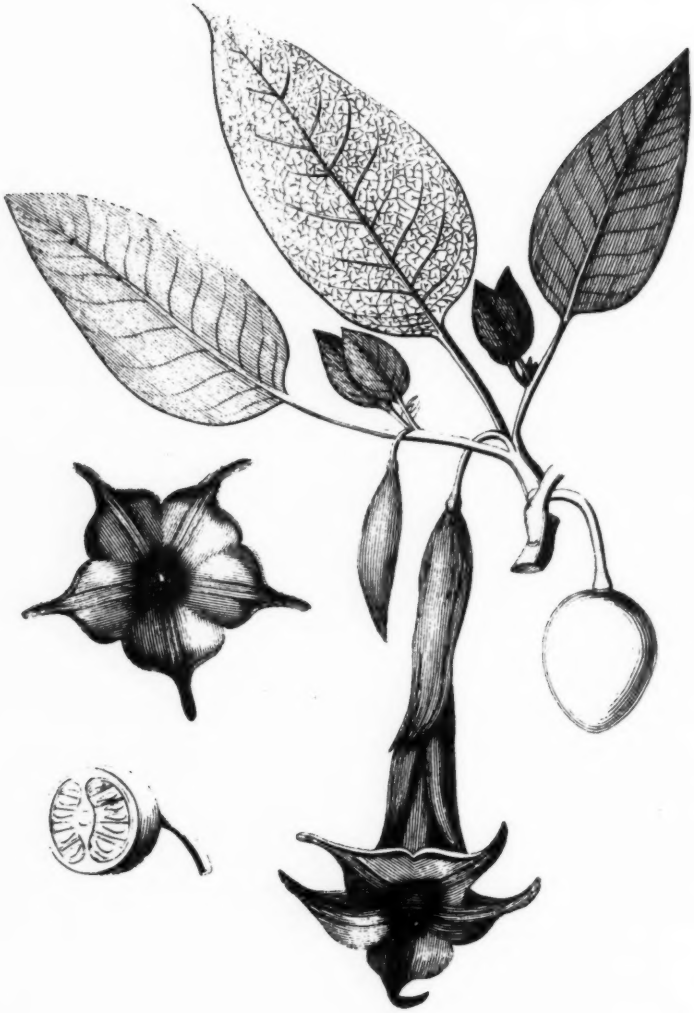

Fig. 8. Datura arborea. From Feuillée's Journal des Observations physiques, mathématiques, et botaniques...II: plate XLVI (1714).

relatively small while those of D. ferox are few in number, relatively stout, with the uppermost spines distinctly longer and larger. Datura ferox is reputed to be native in China.

Datura Metel (fig. 6) is the only other species believed not to be native in the western hemisphere. It is widely distributed as a weed in tropical Asia, and may be native in India. It is said that the priestess of the Oracle at Delphi was under the influence of a drug prepared from this species when she interpreted the Oracle. We have sure knowledge of the medicinal use of this species at an early date from the writings of Abu Mansur, an Arabic physician writing in the tenth century after Christ. In India it has been widely and extensively used by criminals to stupefy or kill their victims.

Like Datura Stramonium, D. Metel is variable as to flower color. The white-flowered form has been called D. alba Nees, and Linnæus himself erected the name D. fastuosa for the purple-flowered phase. Double-flowered forms are known (fig. 6 represents such a form), and I suspect that the taxon D. chlorantha Hooker, a double-flowered form, may belong here.

Datura Metel resembles D. Stramonium in habit, but may be distinguished by the broader, entire or only weakly lobed leaves, the larger flowers (to 15-20 cm. long), and by the fruits, which are bent to one side, or are nodding when mature, never erect, and which are tuberculate, or with short, blunt spines, not with slender, elongate spines.

Both the epithet "Stramonium" and the epithet "Metel" are examples of pre-Linnæan generic names (nouns) used as specific epithets, as mentioned by Dress (Baileya 3[1]:60, 61). It is further to be noted that in such cases, and in the case of commemorative adjectival epithets, it has been customary in the past to use an initial capital letter. Recently sentiment has been expressed, ostensibly in the name of uniformity, to decapitalize all specific epithets. Such a move is unfortunate, since it would make nouns in apposition grammatically meaningless, and it changes the meanings of adjectival names. A good example of the latter case is the name of a taxon to be treated below, Datura Rosei. If decapitalized one might assume that the specific epithet referred to the color of the flowers, or perhaps to some rose-like morphological feature of the plant - whereas, in actuality, the name was given in commemoration of Dr. J. N. Rose, who collected the type material of the species.

To return to the species - two other cultivated taxa with nodding fruits are reputedly related to D. Metel. Both are native in North America. Both have been used medicinally or ceremonially by the American Indians. Both are pubescent. Both have large, globular capsules covered with many long, slender spines. They may be readily distinguished, however, by the lobation of the corolla. Datura meteloides has 5 lobes to the limb of the corolla, while D. innoxia (fig. 7) has 10 lobes.

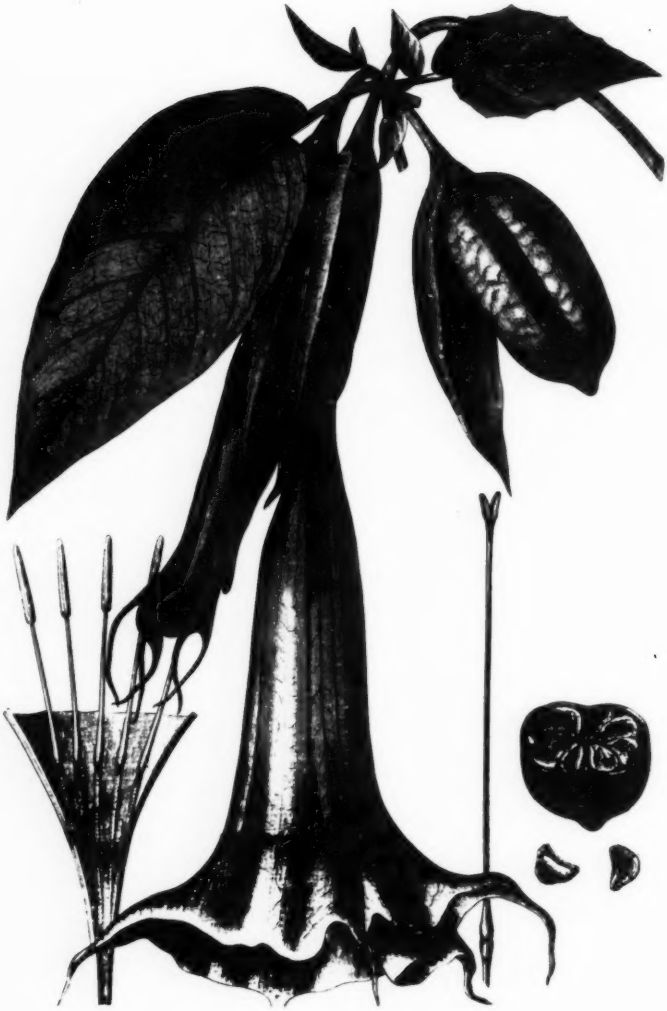

Fig. 9. Datura candida. From the illustration labelled Datura arborea, in Ruiz and Pavon's Flora Peruviana et Chilensis II: plate CXXVIII (1799).

Datura ceratocaula is a rather anomalous species. It is an aquatic or paludial plant, native in Mexico (erroneously ascribed to Cuba in the original description). The stems are rather fleshy, the leaves are pinnately lobed, the calyx is circumscissally dehiscent. The stamens are exserted from the tube of the corolla - the only species in which this is supposed to occur. The corolla is whitish, stained with blue. Though the flower is erect, the fruit, which is a smooth capsule, is deflexed.

Finally, we are left with the tree-daturas. These have sometimes been segregated as a separate genus, Brugmansia. This genus was said to differ from Datura primarily in that the calyx is persistent, not dehiscent and deciduous. Unfortunately this character is not consistent within the group, being of specific importance only. The group is held together, however, by its arborescent habit, large pendulous flowers, and by the calyx which either persists entire around the mature fruit, or is dehiscent at the base - never circumscissally dehiscent above the base.

Datura arborea is the name frequently applied to any white-flowered species in this group. However, all material that I have seen bearing this name is either D. candida or D. suaveolens.

The name Datura arborea was based by Linnæus on a plant illustrated (fig. 8) by Louis Feuillée in his "Journal des Observations physiques, mathématiques et botaniques faites..sur les Côtes orientales de l'Amérique Méridionale..." of 1714-25. This plant is distinguished by the distinct sinuses between the lobes of the corolla, by the peach-shaped fruit, and by the calyx's being completely deciduous. The corollas never exceed 17 cm. in length. A closely related species, D. cornigera, differs from D. arborea in the pubescent, angularly lobed leaves, not entire and glabrous.

Datura candida (fig. 9) is a species known only from cultivated material. Ruiz and Pavon illustrated it in the second volume of their "Flora Peruviana et Chilensis" of 1799, as D. arborea, under the mistaken impression that this was the plant meant by Linnæus. It was not. The differences between the two species may be summarized in tabular form as follows:

D. arborea (fig. 8)	D. candida (fig. 9)
Corolla less than 17 cm. long	Corolla 20 cm. or more long
Lobes of the corolla - limb separated by a distinct sinus	Lobes of corolla-limb not separated by a distinct sinus
Calyx deciduous with the corolla	Calyx persistent around the mature fruit
Fruit ovoid	Fruit cylindrical

Datura suaveolens differs from the preceding species by its five-toothed calyx and long, fusiform fruit. The calyx is completely deciduous. It is a native of the States of Minas Geraes and Sao Paulo in Brazil.

Fig. 10. Datura sanguinea.

Finally, we are left with the species with reddish flowers. In general cultivated material is referable to Datura sanguinea, but we have one record of cultivation in this country of Datura Rosei. The distinctions between the two species may be summarized as follows:

D. sanguinea (fig. 10)	D. Rosei (fig. 11)
Leaves entire or sinuate-margined	Leaves angular - toothed
Corolla about 25 cm. long, glabrous	Corolla 15 - 18 cm. long, pubescent
Calyx with 2 or more large lobes, about 1/2 as long as the corolla	Calyx with a single lobe, with a horn-like apex, about 1/2 as long as the corolla.

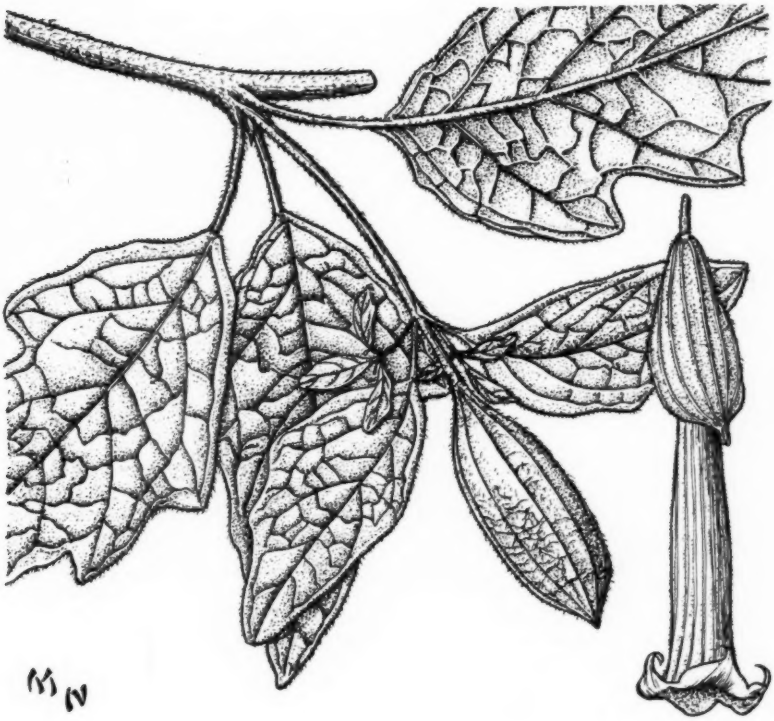

Fig. 11. Datura Rosei.

Dendrocalamus strictus at Brooklyn Botanic Garden

George Kalmbacher
Brooklyn Botanic Garden

A small clump of the Calcutta bamboo, Dendrocalamus strictus Nees, planted in the greenhouse of the Brooklyn Botanic Garden forty-two years ago, has been blossoming since about the beginning of last November for its first (and presumably last) time. The flowering period is probably over now (Feb. 1). In nature seeds are not ripely formed until June.

When, during its lifetime, the culms or canes reached about ten meters in height, they threatened to push the glass off the roof of our greenhouse and were then cut to the ground. The plant was also drastically restricted to prevent spreading, so that flowering found it with six hollow culms from 2 to 5 cm. in diameter. The floral display lacked color, but in substance certainly was impressive, with its compound slender axes of many branches, the spiny ball-like heads strung diffusely along the inflorescence framework in large numbers.

These dense prickly heads measured from 2.5 to 4.5 cm. across and each was separated from its next neighbor by about 3 cm. from periphery to periphery. One average head was counted for spikelets and found to hold 375, each spikelet with two spines projecting, one from the blade of each lemma, to lengths up to 6 mm.

Dendrocalamus strictus is monocarpic, i.e., it blooms only once after a more or less long life and then dies. The crop of seeds of one plant will produce progeny that are destined to live a number of years and then flower - most of them - all together at the same time and for the first time, after which fruit is formed as the last gesture of the living plant. Plants derived by vegetative propagation of any of the progeny will continue the same pattern of growth-period, but in both cases, if the number of plants is large enough, there will be occasional plants from year to year that flower and die after fruiting, not waiting for the year of the grand floral celebration.

Dendrocalamus strictus grows over a very wide area in India and Burma, being found in the dry hills. It is the most widespread and common of India's rich indigenous bamboo flora, and is cultivated in addition. Among its many uses is that for fish-poles. Because of the strength of the culms, they are considered to be among the best for surf and deep-sea fishing.

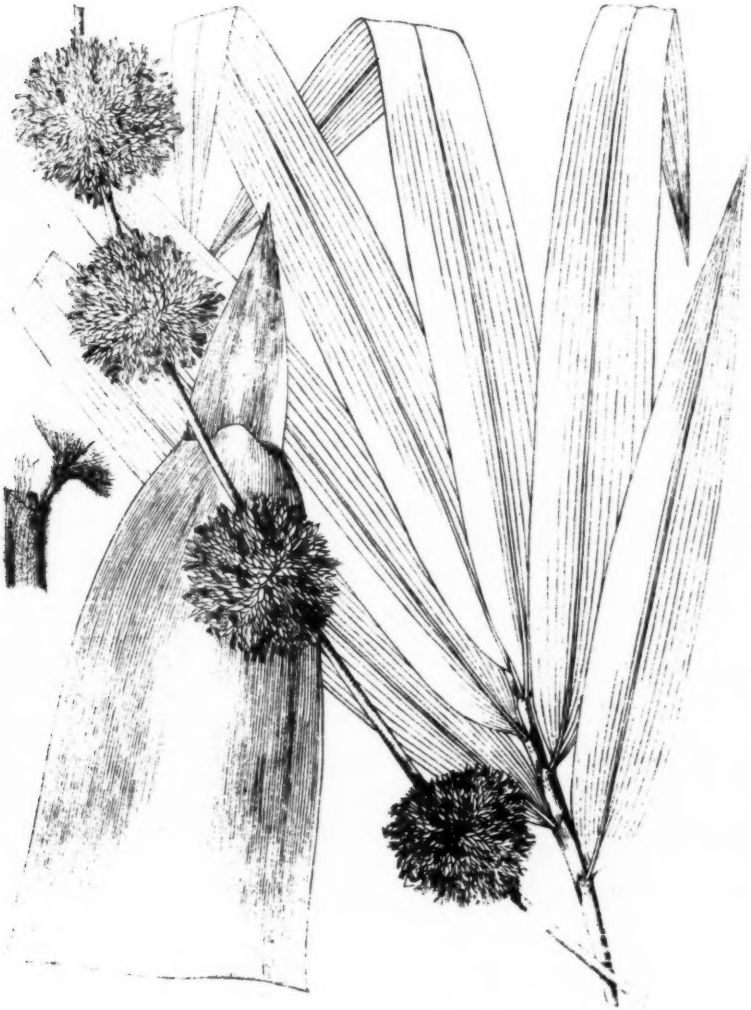

Fig. 12. Dendrocalamus strictus. Adapted from Annals of the Royal Botanic Garden, Calcutta VII: plate 68 (1896).

Our plant was obtained from Royal Palm Nurseries, Oneco, Florida, and was accessioned in the spring of 1914.

Because the shoots grow so fast during the early period of their development, a rod placed alongside a culm after it has started bouncing out of the ground, and recording its daily progress, should prove an instructive and popular attraction in a public display.

[Note: As Mr. Kalmbacher has pointed out in a private communication, Bailey's "Manual of Cultivated Plants" (1949), in the key to the cultivated grasses on page 133, describes the bamboos as having two or three styles, whereas some actually may have only one, either simple or with two to six stigmas. In the genus Dendrocalamus there is only a single (usually simple) style.]

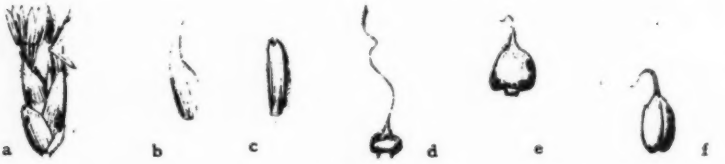

Fig. 13. Dendrocalamus strictus: a, spikelet; b, lemma, or flowering glume; c, palea; d, pistil; e, f, caryopsis or fruit. Adapted from Annals of the Royal Botanic Garden, Calcutta VII: plate 68 (1896).

Technical Name for the Polyantha Rose: a Correction

The publication of Dr. Shinners' "Technical Name for the Polyantha Rose" in the last issue of Baileya (Vol. 3, No. 4, page 171) has brought a note from Dr. Benjamin Blackburn, calling attention to an earlier, though relatively recent, publication of a binomial for this same taxon, by himself, in his "Trees and Shrubs in Eastern North America." Since Dr. Blackburn's binomial supersedes that of Dr. Shinners because of priority, the latter must now be treated as a synonym. It is interesting that both botanists chose to honor Dr. Rehder in naming the polyantha rose, though in slightly different form. The valid name, with its synonyms, follows:

Rosa X Rehderiana Blackburn, Trees and Shrubs in Eastern North America: 249 (1952), "X Rosa Rehderiana."

Rosa polyantha Carrière, in Revue Horticole 48: 253 (1876). Non R. polyanthos Roessig, (1799); nec R. polyantha Sieb. et Zucc., (1843); nec (?) R. polyantha var. Hort. ex Willmott, The Genus Rosa 2: 31 (1910).

Rosa multiflora X chinensis Rehder in Bailey, Cycl. Am. Hort. 4: 1549 (1902); Bib. Cult. Trees and Shrubs: 311 (1949).

Rosa polyantha, pro nomen illegitimum, Wylie in Gardening Illustrated 68, 8: 214 (1951).

Rosa X Rehderi Shinners, Baileya 3, 4: 171 (1955).

Siderasis fuscata

Harold E. Moore, Jr.

The evanescent flowers of our cultivated spiderworts (Tradescantia) and their wild relatives in the United States are familiar to many gardeners. Lasting but part of a day, they coalesce into a watery mass when they have finished blooming. If we could always study the spiderworts and their relatives in the family Commelinaceæ from the fully expanded flowers of living plants, our task would be much easier, for the delicate parts of the flower are fascinating in their variety of form and arrangement. Unfortunately, the botanist ordinarily must work in the herbarium from dried specimens collected in faraway places. Unless prepared with great care, specimens of commelinaceous plants are extremely difficult to study. It is no wonder, then, that there are differences in the classification of the family.

One of our rare but very attractive foliage plants, sometimes listed in catalogues as Tradescantia fuscata, is an example of a species that has been classified in different ways. When living specimens, probably originating from Corcovado Mountain near Rio de Janeiro, Brazil, were grown in England early in the 19th Century, they resembled Tradescantia so much that they were described as Tradescantia fuscata by Conrad Loddiges. It has become apparent in the intervening years that there is a considerable difference between the true tradescantias as we define them today and Tradescantia fuscata. As early as 1837, the American botanist Constantine Rafinesque had established a new genus, Siderasis, for the Brazilian plant. He referred to the plant described by Loddiges but failed to use the latter's specific epithet. Instead, he called it Siderasis acaulis. Rafinesque's work was often overlooked or ignored because of his personal eccentricities and later writers used a second generic name, Pyrrheima, for the same thing.

Under our present rules, the earlier generic name must be used or the later one conserved by formal action in a botanical congress. Although there are some errors in Rafinesque's account of Siderasis, there is no mistaking his meaning. There is probably only one species, Pyrrheima minus Hasskarl being apparently no more than a variant of S. fuscata, and P. rhizanthum Ule is now known as Geo-

genanthus rhizanthus (Ule) Bruckner. To conserve Pyrrheima, a name no more familiar to the gardening public than Siderasis, would serve no useful purpose. If the plant is to become more widely known, as it deserves to be, it would be better to have a name that meets the requirements of today's rules of nomenclature. To satisfy these requirements a new combination must be made.

Siderasis Rafinesque, Flora Telluriana 3: 67 (1836) [1837].

Pyrrheima Hasskarl, in Flora 52: 366 (1869).

Siderasis fuscata (Loddiges) H. E. Moore.

Tradescantia fuscata Loddiges, Botanical Cabinet 4: plate 374 (1819).
Siderasis acaulis Rafinesque, Flora Telluriana 3: 67 (1836) [1837].
Pyrrheima Loddigesii Hasskarl, in Flora 52: 367 (1869).
Pyrrheima minus Hasskarl, in Flora 52: 368 (1869).
Pyrrheima fuscatum (Loddiges) Backer, Handbook of the Flora of Java 3: 37 (1924).

In addition to the colored illustrations of Siderasis fuscata in Loddiges' "Botanical Cabinet," in Edwards' "Botanical Register" 6: plate 482 (1820), and in "Curtis's Botanical Magazine" 49: plate 2330 (1822), it has been illustrated more recently in the American journal "Addisonia," where a colored plate and description appear in volume 21: plate 689 (1941). Plants from which the accompanying line drawing (fig. 13) were made were provided for study through the kindness of Mr. A. B. Graf of Julius Roehrs Company, Rutherford, New Jersey. They flowered at Ithaca from late March through early May, 1955, and showed a variation in color of the flowers from almost violet to rose-purple.

The very dense coat of short, erect, reddish-brown hairs that covers the elliptic-obovate leaves, peduncles, pedicels, and sepals has suggested both the generic names and the specific epithet. Rafinesque, in publishing his description, wrote "Siderasis Raf. (rusty fur)..." while Hasskarl coined Pyrrheima from two Greek words, pyrrhos and heima, meaning tawny cloak. The Latin adjective fuscus (dark, tawny, swarthy) is the root of our specific epithet. A band of silvery white runs lengthwise through the center of each leaf in pleasing contrast to the deep green of the blade and its velvety cloak of hairs. On the reverse, the surface is beautifully flushed with wine-red.

Of particular interest botanically is the form of the inflorescence. Rosettes of leaves are borne on a stoutish rhizome and from their centers, in the axils of small, hairy, pointed bracts, a

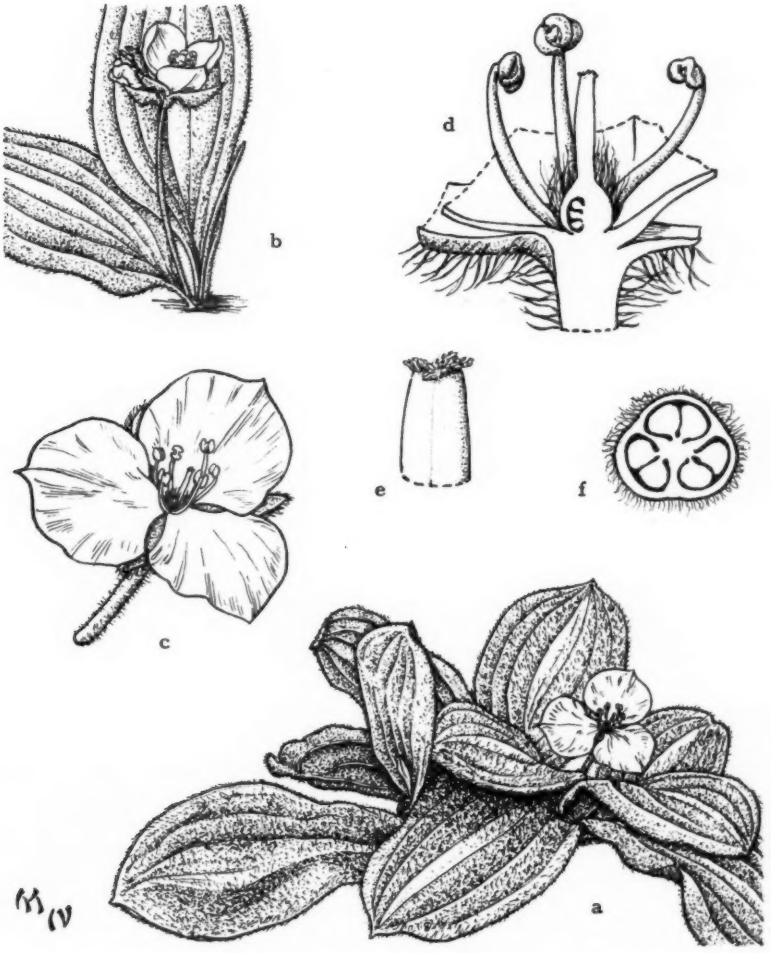

Fig. 14. Siderasis fuscata: a, habit x 4/5; b, inflorescence x 4/5; c, flower x 1 1/2; d, vertical section of flower (parts of calyx and corolla cut away) x 5; e, stigma and tip of style x 16; f, cross-section of ovary x 10.

series of peduncles rises in succession. Each peduncle bears 1 to 4 but often a pair of flowers nearly 2.5 cm. across. This inflorescence is quite unlike the leafy-bracted inflorescence of Tradescantia. The different inflorescence, together with the absence of a stem, and a reported difference in the arrangement of seeds, clearly separates Siderasis from Tradescantia and its other relatives.

As grown at Cornell, Siderasis fuscata is treated as a conservatory plant in a greenhouse with a night temperature of 60° F. It thrives there and by the production of offsets makes a compact crown in time. The attractive flowers are ornamental in themselves but are scarcely more so than the soft foliage for which it will be prized.

"What Flowering Tree is That?" by Edwin A. Menninger. 110 pages, 4 colored plates, many small halftones. Published by the author, Stuart, Florida, 1956. Price: paper, $1.50; cloth, $3.00.

The subtitle of this small book, "A Handbook for the Tropics," more nearly indicates its contents than does the title, for it actually offers no means for identifying trees for which the names are not already known. Instead, there are very brief nontechnical descriptions of about a thousand trees (and shrubs) worthy of cultivation in central or southern Florida, and which are being grown by Mr. Menninger.

The latter is a printer and publisher by vocation, but a nurseryman by avocation, and has been enthusiastic and energetic in his quest for unusual ornamental exotic flowering trees and shrubs suitable to the Florida climate. Many rare things now obtainable owe to him their introduction into cultivation in this country. A Northerner reading this book yearns for an estate in Florida or southern California where he might grow and enjoy the richly colorful and often fragrant plants described herein.

The various species are grouped by family, and the families are arranged alphabetically according to their scientific names. Both common and scientific names of the species are given, together with very short descriptions which mostly are concerned only with the obvious characters which give the plants horticultural merit. Some worthwhile trees with inconspicuous flowers are included, but are distinguished by being described in smaller type. The halftone illustrations are numerous, ranging in quality from good to poor, but serve to suggest the variety and beauty of woody plant material available to the Florida gardener.

W. J. D.

Notes on the Status of Philodendron Mandaianum

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University of Washington
Seattle, Washington

Philodendron Mandaianum Hort. is one of several cultivated philodendrons of very obscure origin. It has long been reputed to be a hybrid of Philodendron erubescens C. Koch & Augustin × Philodendron hastatum Hort., the latter name itself of no botanical standing as there are apparently two species in cultivation using this name, neither of which matches P. hastatum Koch & Sellow (Birdsey 1951). Unfortunately, apparently no record was made of this supposed cross. On the basis of its more intense coloring and its close similarity vegetatively to P. erubescens, it has been suggested that P. Mandaianum may be only a color selection of that species (Birdsey 1951). Engler describes P. erubescens as being eight-locular and places it in the subsection Belocardium which is characterized as having uniovular locules (Engler and Krause 1913). Birdsey, in a more recent description, also describes it as eight-locular (Birdsey 1951). The recent flowering of a specimen of P. Mandaianum in this writer's collection made it possible for a check to be made of its relationship to P. erubescens. The general floral characteristics are closely similar, but a major difference occurs in its having two ovules per locule and in being mostly six-locular (see fig.15, i and j). In this respect it is closely similar to one of the species incorrectly known as P. hastatum. The two inflorescences examined on maturity failed to produce pollen, the anthers being sunken and undeveloped (see fig.15, e and f). Because of the unavailability of further flowering material it is difficult to say whether this sterility is inherent or caused by a possible cultural deficiency.

These observations, though far from conclusive, seem to indicate that this plant is not a selection of P. erubescens and tend to strengthen the possibility of its hybrid origin. Until further evidence is forthcoming it must also be admitted that the question of possible species standing is raised. Lack of flowering material has made it impossible to attempt a duplication of the cross at this time. A chromosome count of the plants in question could also possibly shed some light on the problem. Following is a vegetative and floral description. The color descriptions used follow the standards of the British Colour Council wherever possible.

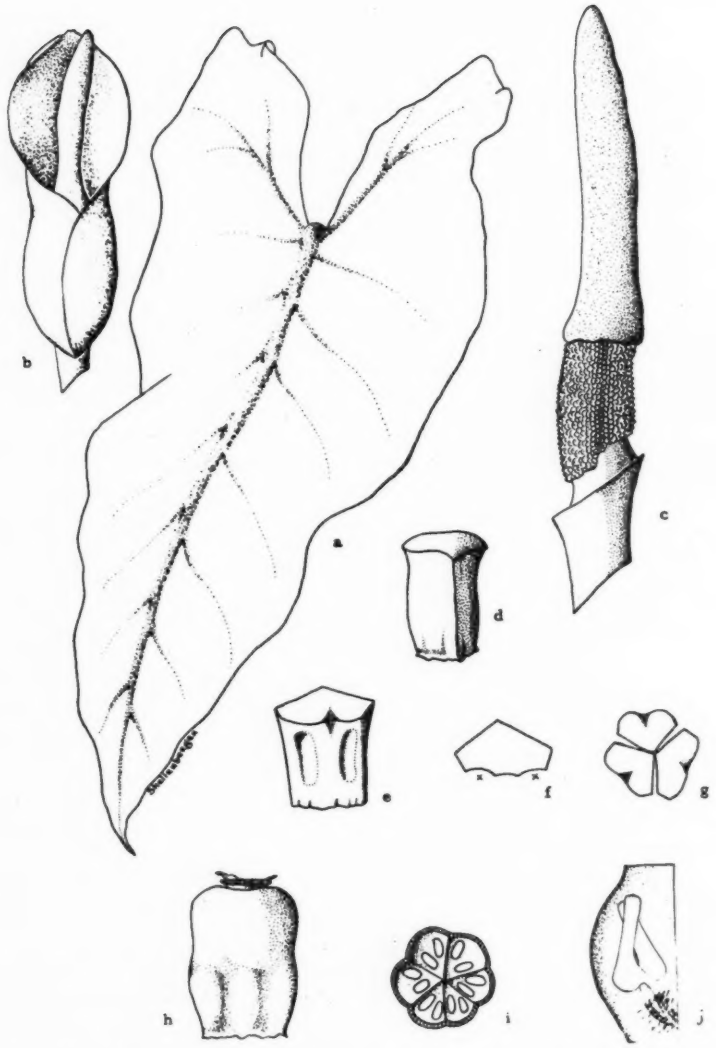

Fig. 15. Philodendrum Mandaianum: a, mature leaf x 1/3; b, inflorescence x 1/3; c, spadix x 2/5; d, staminodium x 9; e, stamen x 9; f, cross-section of stamen showing sunken, undeveloped anthers at x; g, staminate flower, from above, x 12; h, pistillate flower (consisting of a single pistil) x 12; i, cross-section of ovary x 12; j, vertical section of a locule (cell) of ovary, showing paired ovules.

Philodendron Mandaianum Hort. Stem scandent, dark reddish-green becoming reddish-gray with age. Cataphylls (bracts at the bases of the leaves) mostly chrysanthemum red (824/1, British Colour Council), quickly deciduous, about 12.5 cm. long. Petioles terete, about 3 dm. long, about 1.5 cm. thick, maroon (1030, B.C.C.), sheathing in juvenile stage, basal area slightly flattened on mature leaves; blade coriaceous, lanceolate-sagittate, upper surface dark green, lower surface maroon (1030/1, B.C.C.), margin translucent maroon (1030/3, B.C.C.), apex abruptly acuminate, basal lobes oblong to semi-orbicular, sinus parabolic, main lateral veins about 6, primary lateral veins of the basal lobes 2-3 on each side, maroon (1030/1, B.C.C.). Peduncle 8 cm. long, maroon (1030/1, B.C.C.), terete; spathe about 14.5 cm. long, hooded, boat-shaped, outer surface maroon (1030/1, B.C.C.), inner surface maroon (1030, B.C.C.), tube 6-7 cm. long, tip about 2 mm. long. Stalk of spadix about 5 mm. long. Staminate portion of inflorescence chalk-white, about 8.5 cm. long, constricted about one third from base; staminate flowers with 2-4 stamens; staminodia (at base of staminate portion of inflorescence) triangularly cylindrical. Pistillate part of inflorescence cylindrical, reddish, about 3 cm. long, about 1.75 cm. thick; pistils oblong-ovoid, 1.5-2 mm. long, red spotted, mostly six [-7] locular, locules two-ovular, stigma reddish, discoid, sometimes with linear appendages.

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Birdsey, M. R. 1951. The Cultivated Aroids. 140 pp. Berkeley, Calif.
Engler, A. and Krause, K. 1913. Araceæ. In Engler, Das Pflanzenreich 60 (IV. 23. Db). 143 pp. Leipzig.
British Colour Council in collaboration with the Royal Horticultural Society. 1938, 1941. Horticultural Colour Chart. 2 vols. London.

"Weeds of Canada" by Clarence Frankton. 196 pp., 90 pls. by W. H. Wright, Publication 948, Botany & Plant Pathology Division, Science Service, Canada Department of Agriculture, Ottawa, Ont. June, 1955.

"Weeds of Canada" is a new non-technical work designed for the agriculturist and horticulturist of Canada, but useful to others of temperate regions, as an aid in the identification and control of the more commonly encountered weeds. To the average horticulturist, seeking a reliable but inexpensive reference, its chief value will probably be found in the excellent 90 full-page plates, whereon are depicted 133 species of weeds. Each plate is faced by descriptive text, not only of the species illustrated but also of related kinds and the characters by which one may be distinguished from another. A total of 133 species is treated.

For each of the principal weeds there is given its Latin name, all English names by which it is known in the various Canadian provinces, notes on place of origin and relative frequency in Canada, habitats, and control recommendations. A good index is provided to the illustrations as well as to all names found in the text.

G. H. M. L.

Notes on Cultivated Scrophulariaceæ
1. Alonsoa

Gordon P. DeWolf, Jr.

Alonsoa is a genus of about seven species of shrubs or herbaceous perennials (or annuals, according to some accounts) native in the mountains of Central and South America. Several of the species are grown occasionally, and have been grown in the past, for their showy reddish or orangish flowers which are produced freely. They are easily cultivated as garden annuals in the North, or as perennials in the South, or in a cool greenhouse, coming readily from seed. They may also be propagated by cuttings.

As is the case with many plant genera, the taxonomy and nomenclature of even these few species has been much confused in the past, so much so that only a critical comparison of the original collections, presumably preserved in herbaria in Britain, Germany, and Spain, can finally untangle the mess. The first species of this alliance which was made known to science was a plant sent by Jose Celestino Mutis to Linnæus, and described by the younger Linnæus in the "Supplementum Plantarum" of 1781 as a species of the genus Scrophularia. This was the common, weedy plant now known as Alonsoa meridionalis (Linnæus f.) Kuntze. This same plant was described, with another epithet, under the generic name Alonsoa by Hipolito Ruiz and Jose Pavon in their "Systema Vegetabilium Floræ Peruvianæ et Chilensis" of 1798 (a work which I have not seen). Besides this plant, which they called Alonsoa caulialata, Ruiz and Pavon described four other species, one of which is not now included in the genus. The only other species of horticultural importance which they missed was one described by Eduard Regel in 1854, based on material grown from seed sent back from Peru by Warscewicz. Various other names have been proposed from time to time - two or three are probably valid - but the majority are horticultural appellations for various minor forms.

While a study of the original specimens is needed, as I have indicated, the following key and notes culled from the literature and the herbarium, concerning the species cultivated in this country, may be of some use and interest.

Fig. 16. Alonsoa acutifolia. From Gartenflora 24: plate 849 (1875).

Key to the Cultivated Species of Alonsoa

1. Leaves linear, about 2 mm. broad and 4 cm. long. . . . . A. linearis
1. Leaves linear-lanceolate, or broader.
   2. Leaves linear-lanceolate or narrowly lanceolate (or sometimes broader in the hybrid A. × intermedia).
      3. Leaves 5 mm. broad, 2-3 cm. long; corollas to 1 cm. long . . . . . A. acutifolia
      3. Leaves 5-8 mm. broad, 2.5 - 3.5 cm. long; corollas to 5 mm. long. . . . . A. × intermedia
   2. Leaves broadly lanceolate to ovate.
      4. Leaves lanceolate, blades to 3 cm. broad, 6 cm. long, deeply serrate. . . . . A. incisifolia
      4. Leaves ovate-lanceolate to ovate, weakly or finely serrate.
         5. Stems simple or weakly branched; corollas 3-5 mm. long. . . . . A. meridionalis
         5. Stems copiously branched; corollas 8-10 mm. long. . A. Warscewiczii

The first of these, Alonsoa linearis, is a Peruvian shrub growing to 1 m. tall. The flowers, which are about 5 mm. long, and 1.3 cm. in diameter, are brick red. The exceedingly narrow leaves are distinctive. This has sometimes been listed as A. linifolia, and I suspect that the epithet "liniflora" is only a misprint and really refers to this species.

Alonsoa acutifolia is a half-shrubby perennial from the mountains of Peru. It is related to A. incisifolia, from which it may be distinguished by its smaller, narrower, and less cut leaves. It is related as well to A. meridionalis, from which it is readily separated by its larger flowers. Alonsoa meridionalis has the flowers

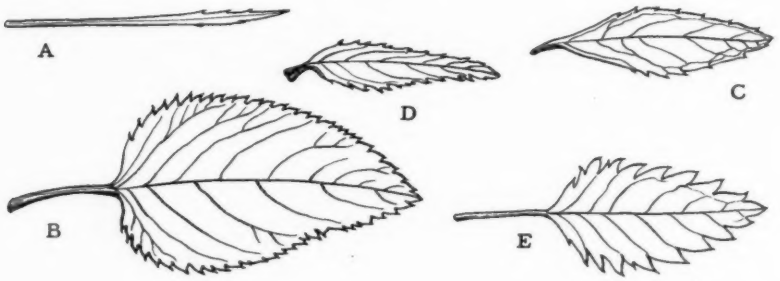

Fig. 17. Typical leaves of various species of Alonsoa: A, A. linifolia; B, A. meridionalis; C, A. × intermedia; D, A. acutifolia; E. A. incisifolia.

about 3 mm. long and 6-7 mm. broad, while in A. acutifolia the flowers are 1 cm. or more long and 2-2.5 cm. in diameter. I have seen no specimens of cultivated material of this, but it would seem to be a very desirable plant.

Alonsoa × intermedia is reputed to be a hybrid between A. linearis and A. incisifolia. It was illustrated in "Loddiges' Botanical Cabinet" in 1828, with the comment that it had then been long in cultivation. The name was apparently lost sight of, and the only contemporary reference which I find is that in the "R. H. S. Dictionary of Gardening," where it is referred to the synonymy of A. incisifolia. I have no evidence that it is cultivated in this country today, but there are three specimens from England in the Bailey Hortorium herbarium, two labelled "Alonsoa caulialata" and one labelled "Alonsoa 'Compact Scarlet'," which seem to belong here. The cultivars 'Compact Scarlet' and 'Compact Pink' are in the trade in Britain at present, where they are termed annuals. These are small plants, probably never getting to be more than 30 cm. tall, with linear or linear-lanceolate weakly toothed leaves. The flowers are small, about 5 mm. long and 1 cm. broad and abundantly produced. It seems likely that these cultivars should be referred to this taxon.

Alonsoa incisifolia, the second putative parent of A. × intermedia, was introduced into cultivation in England in 1795, having been brought (or sent) from Chile by Archibald Menzies, surgeon-naturalist on Vancouver's voyage to the Pacific, 1790-1795. The flowers are intermediate in size between those of A. acutifolia and A. meridionalis. It is immediately distinguished, however, by its deeply serrate leaves. It is reputed to be a strong-growing plant, though its dark red flowers are not so showy as the more brilliant colors of some of the other species.

Alonsoa meridionalis is apparently the correct name for a rather variable taxon which ranges from Peru to Mexico. It seems to have been a Peruvian representative of this taxon to which Ruiz and Pavon gave the name A. caulialata some 17 years after the younger Linnæus had named a Columbian representative Scrophularia meridionalis. The younger Linnæus' specific epithet, despite the fact that it was placed in the wrong genus, is the earliest one available and so is the one which must be used. Ruiz and Pavon's specific name was, however, used for many years and it was not until 1891 that Otto Kuntze correctly made the nomenclatural transfer of the younger Linnæus' epithet to Ruiz and Pavon's genus. The citation of two authorities for the name (so-called double author-citation), with the original author's name in parentheses, indicates this history.

Alonsoa meridionalis, as one might suspect from its wide distribution, appears to be a variable plant, and probably a bit of a weed in some places. The flowers are quite small and variable in

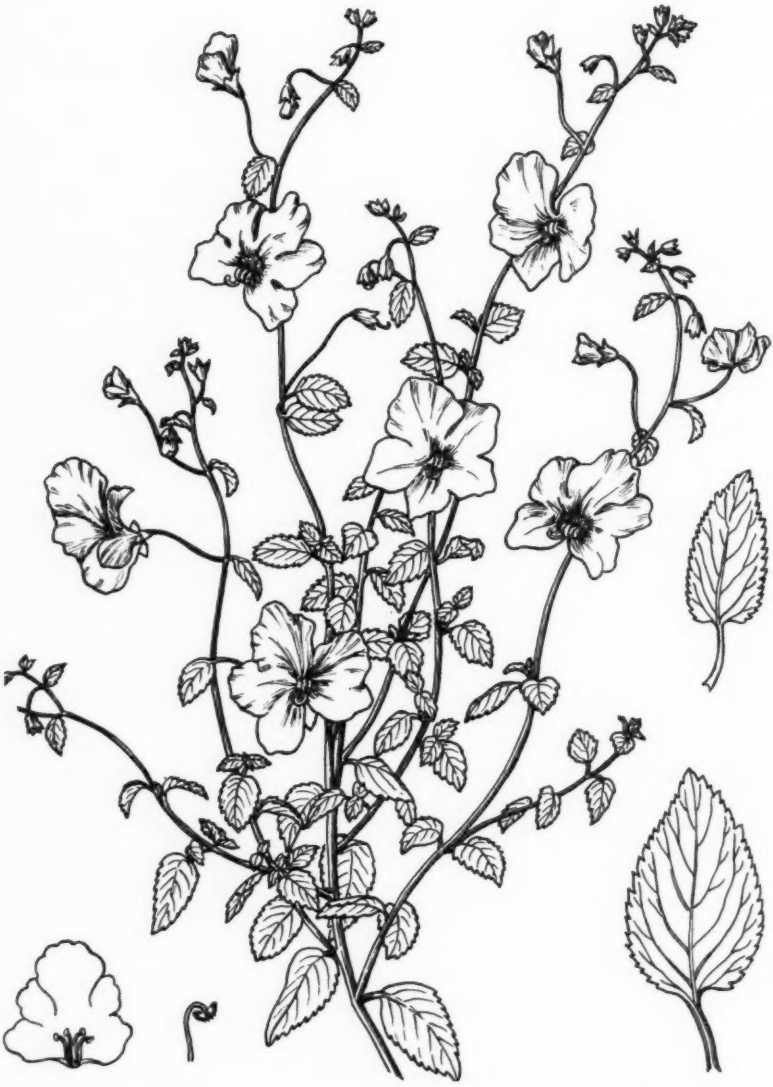

Fig. 18. Alonsoa Warscewiczii. Adapted from Gartenflora 3: plate 91 (1854).

coloring, generally some shade of red or orange, though at least one strain is known with white flowers. The plants grow 60 cm. or more tall. Its garden value would seem to be dubious.

The name Alonsoa peduncularis is occasionally found in catalogues. I have seen no material of wild or cultivated material under this name. The taxon was described from South African material from a restricted area, and is now presumed to be extinct in nature. If the plant in question was an Alonsoa, the occurrence of a species of an Andean genus in southern Africa would be of great significance phytogeographically. The description in the "Flora Capensis" sounds suspiciously like that of A. Warscewiczii. In any event, I should be very interested to see material of any plants of this name.

Finally, we have Alonsoa Warscewiczii, named for its discoverer, Josef von Warscewicz, a Polish gardener and horticultural explorer of the last century, who is also noted as a collector of hummingbirds. The taxon was described by Eduard Regel, "Obergärtner" at the botanic garden in Zurich and editor of "Gartenflora," from plants grown from seed sent from Peru.

Alonsoa Warscewiczii is a more or less erect, much branched shrub, 30-100 cm. tall. The leaves are distinct from those in the other species in that the bases tend to be cordate, not distinctly narrowed to the petiole. The flowers are relatively large and vary in coloration from scarlet to orange. It, or some of the garden forms offered, is probably the best taxon for general cultivation. Several Latin names have been given to color forms of this species. Unfortunately, these names seem now to be misapplied to other species and thus have little value horticulturally or botanically. They are accounted for in the appended finding list of Alonsoa names which are to be found in horticultural literature or in the trade. The valid, or correct, names are underscored; the invalid are not.

Finding List of Alonsoa Names

acutifolia Ruiz and Pavon
caulialata Ruiz and Pavon :: meridionalis
grandiflora Hort. :: Warscewiczii
incisifolia Ruiz and Pavon
× intermedia Loddiges
linearis Ruiz and Pavon
liniflora Hort.: probably a misprint for linifolia, which is A. linearis
linifolia Roezl :: linearis
meridionalis (Linnæus f.) Kuntze
miniata Hort.: probably a form of × intermedia
Mutisii Hort. non Steudel :: Warscewiczii
peduncularis (Kuntze) Wettstein
Warscewiczii Regel

The Origin and History of the Easter Lily

Mary L. Holmes

The Easter lily market in the United States today may well owe its existence to a Philadelphia horticulturist, William K. Harris. In about 1876 he introduced the first bulbs of a white lily, growing in Bermuda, to the Philadelphia market. This was called the Easter lily, and later the Harris lily in his honor, because it was marketed in time to flower at Easter season. Although disease ruined the trade in about twenty years, Harris popularized his form of Lilium longiflorum var. eximium and indirectly helped increase world trade in lilies. His enterprise marked the beginning of the New World's share in exporting lilies originally native to the Far East.

Of course, the lily family had been associated with Easter and the Christian religion long before Harris took advantage of the lily from Bermuda in the nineteenth century. Renaissance paintings of holy scenes and of the Virgin Mary often depicted lilies, but these were Lilium candidum, the Madonna lily, a species different from the Lilium longiflorum whose varieties are associated in America with the Easter season today. The Madonna lily was known to the Egyptians and Assyrians, and was figured on their monuments. It is native to Asia Minor, but has been grown for centuries in Europe.

Lilium longiflorum, from which the Easter or trumpet lily (known in much of Europe today as the Bermuda lily) comes, is indigenous to the southern islands of the Ryukyu Archipelago, south of Japan. Japanese gardeners had cultivated the wild lilies long before they were introduced to Europe. It was Carl Peter Thunberg, student of Linnæus, working as surgeon-doctor for the Dutch East India Company, who first collected specimens of the lily in Japan. During his stay in 1777, Japan was still closed to foreigners and Thunberg was not permitted to travel about the islands, so he arranged for some of the Japanese to bring him plants and bulbs. Among these was Lilium longiflorum, which he first mistakenly identified as Lilium candidum and published under that name in "Flora Japonica" in 1784. Ten years later he corrected his error, renaming the plant Lilium longiflorum, and published its descrip-

tion in the "Transactions of the Linnean Society" of London. A reproduction of this description is shown below. In it he indicated that the specimen he described came from Nagasaki. He cited his former identification and explained the characteristics which distinguish L. longiflorum from L. candidum. This citation is interesting as an example of a botanical description of that time.

A year after Admiral Perry opened the islands for trade with America, a Japanese catalogue of bulbs available for world markets included a full-page color illustration of the Easter lily, with a number for ease in ordering, but unnamed.

In the wild the species includes both green- and purple-stemmed forms which sometimes grow together. These were segregated as separate varieties at the time Japanese gardeners began exporting bulbs. Wilson found the species on Okinawa, and reported it as "growing in pockets in the coral rock by the sea. It appears to be a maritime species and unlike most Lilies, a limestone plant.... There is no question about its being truly indigenous on that island and on the others which make up the northern and central groups of the Liukiu Archipelago." This island group has been variously called Oshima, Ryukyu, Loochoo, and Uke-yuri in the lily literature.

LILIUM *longiflorum:* foliis ſparſis lanceolatis, corollis tubulato-campanulatis, caule glabro.

Lilium candidum. Flor. Japon. p. 133.

Japonice: Sjire, Sjiroi, Osjiroi et Siro Juri.

Creſcit in Nagaſaki, Miaco, alibi.

Floret Junio.

Caulis teres, noduloſus, glaber, inanis, erectus, bipedalis.

Folia ſparſa, ſeſſilia, lanceolata, integra, glabra, trinervia, baſi adpreſſa, apice recurva, ſeſquipollicaria.

Corollæ albæ, tubulato-campanulatæ, palmares, erectæ.

Differt a *Lilio candido:* 1. foliis baſi latioribus, apice acutioribus, ſtrictioribus, reflexis, non undatis.
2. corolla triplo longiori, cylindrica.

Lilio bulbifero: 1. corolla maxima, alba.
2. caule lævi, tereti.

Fig. 19. Reproduction of Thunberg's description of Lilium longiflorum. Transactions of the Linnean Society (London) 2: 333 (1794).

Thunberg's discovery awoke European interest in the species, and in 1819 bulbs were successfully transported from the Orient and grown in London. However, the real impetus to production came in 1830 when von Siebold returned from Japan with bulbs of L. longiflorum var. eximium. These were planted in the Botanic Garden in Ghent, Belgium. This planting was evidently lost or destroyed, but the lily was reintroduced in 1840. The growth of the lily export trade in Belgium dates from that decade. In 1836, one English floral journal still had this lily listed among the new and rare species.

Shortly after this time, L. longiflorum var. eximium must have been brought to Bermuda gardens. The date of introduction is not known, but the lily was first reported growing there in 1856, twenty years before Harris was to find it. Evidently the stock came directly from Japan and not from Europe, because all the stories describing its arrival involve sailors or missionaries leaving bulbs at the island when their ships stopped there from the Far East.

Bermuda's marine climate and limy coral rock make it well suited to the bulbs, because of its similarity to the natural habitat of the lilies. Garden culture and selection by growers probably had improved them by the time Harris marketed them.

In recounting the history of its introduction into the United States, Carrière wrote: "This beautiful lily comes to us from the United States, where it has been introduced from Bermuda ... by a lady amateur who brought the bulbs to Mr. W. K. Harris, horticulturist of Philadelphia." Agreement on this origin in several early sources seems to discredit the contemporary report of Anderson that Harris himself procured the bulbs while on a visit to Bermuda for his health. No documentation by Harris of the plant's introduction has been located.

Elie Carrière was the first acceptably to describe botanically (in 1883) the plant Harris had been marketing under the name Lilium Harrisii as early as 1879, and perhaps earlier. He formally named it Lilium Harrisii, and described it, and provided a good illustration of a flowering stalk in the French journal, "Revue Horticole," of which he was editor.

The earliest account I have seen of the introduction of the plant is in a report of the New York Horticultural Society for 1880 (quoted also in the "Gardener's Monthly," July, 1881):

> W. K. Harris, Darby Road, Philadelphia, presents a new lily (Lilium Harrisii), which draws especial notice for its alleged peculiar characteristics. Apparently a variety of L. eximium, it differs widely from that species by flowering in a very young state of growth and much earlier than eximium when forced along with it in the same house. Besides its early flowering both in age and season, it has the peculiarity of sending up flowering shoots from bulblets formed during the season of its growth, so extending its flowering season for a long period.

This lily was awarded a certificate of merit at that time by the New York Society, and again in 1883 by the Royal Horticultural Society of London.

Thomas Meehan reported in the "Gardeners's Monthly" for May, 1882, that one of the latest names the Harris Lily had received at that time was "The New Bermuda Lily." The "New" was dropped as the plant became better known, and in parts of Europe particularly it is still called the Bermuda lily.

Harris supplied the United States and Canada with bulbs from the Bermuda stock for about twenty years. Fifteen percent of his production were shipped annually to England, which at that time imported bulbs of other lily species mainly from Holland. Disease, presumably encouraged by overfertilizing, wiped out the Bermudan and American plantations and brought an end to the trade. By 1887, importing nations were again looking to Japan for stock.

By that time, selections of wild stock propagated in Japanese nurseries had fixed the characters of several other botanical varieties of Lilium longiflorum. The vars. multiflorum and Takesima (known also as var. giganteum) became popular in the wake of the Harrisii disaster. Bulbs of these Japanese variants were shipped to the United States on a fairly large scale, especially to meet the demands for the Easter season. However, nurseries became careless, and allowed propagation and exportation of diseased bulbs. The search for a new source of these varieties led to lily cultivation on the Romi Islands of Japan, but this soon deteriorated because dealers deliberately brought diseased stock in, believing that the new soil would improve them. All lilies there were soon lost to the disease.

Further search led to culture of undersized wild bulbs collected on Okinawa. The selected form was first exported in 1904 under the name L. longiflorum var. formosum (sometimes var. insulare). This is entirely different from Lilium philippinense var. formosanum Wilson, and, although once confused with the latter, has no connection with the island of Formosa. The var. formosum was selected from the purple-stemmed form of L. longiflorum that Wilson later described. These bulbs ripen two months earlier than those on the northern islands of Rosliu and Saitama, where var. multiflorum and Takesima were grown. They could be forced with more certainty that plants would bloom in time for the Easter season in the United States.

When World War II interrupted trade with Japan, United States buyers were forced to seek other sources for the 18 million bulbs it imported each year from Japan. The most recently purchased

bulbs were therefore reserved for propagation uses in the States and soon Easter lily culture became an industry here in its own right. At first lilies were cultivated only in the southern states, but research proved that, with proper care, they can be grown universally. The cultivar 'Croft' and the clone 'Estate' produced by Sydney Croft, in Oregon, are examples of the new varieties that have been developed here. Natal and St. Helena had also developed export industries during the war years, and Japan is again exporting bulbs.

The future of Easter lily culture seems assured, because of the sustained interest in the beauty of the lily and in its keeping qualities as a potted plant and as cut flowers. While L. longiflorum will probably continue to be popular, the introduction of hybrid lilies, designed to meet the same market demands, may increasingly bring new varieties to market that may one day replace it.

Lilium longiflorum is a variable species, in nature and in cultivation. Botanists have found that native variants of the species, isolated on islands and small archipelagoes, have often become so stable that their distinctive characters are inherited and are of sufficient magnitude to cause these variants to be designated as either botanical varieties or formæ. In addition, there are many fancy-named cultivars and clones representing, for the most part, selections of these native colonies.

The botanical varieties may be distinguished as follows:

1. Leaves variegated.
   2. Edges of leaves reddish-brown, margined with a silvery-white line. . . . . .var. vittatum (Wilson) Woodcock & Stearn
   2. Edges of leaves cream-white. . . . . .var. albo-marginatum Moore
1. Leaves uniformly green.
   3. Stems brownish-purple throughout; pollen yellowish-orange. . . . . var. Takesima Duchartre
   3. Stems green, or mostly so (sometimes brownish basally or at nodes); pollen yellow.
      4. Flowers opening upwards, sometimes nearly erect, the mouth of the flower narrower than the length of the trumpet; leaves ascending (not recurved). . . . . var. eximium (Curtois) Baker
      4. Flowers borne at right angles to the essentially erect pedicel, the mouth of mature flower about as wide as the length of the trumpet; leaves recurved.
         5. Leaves mostly 1.0-1.5 cm. wide. . . . . var. insulare Mallett
         5. Leaves 2.0-2.7 cm. wide. . . var. nobile (Wilson) Woodcock & Stearn

The characters used above are taken for the most part either from the treatment by Wilson or from that by Woodcock and Stearn. Neither work distinguished the typical element of the species from other variants. It was figured by Thunberg as having flowers nearly erect and facing upwards. This suggests that there may not be a significant difference between the typical element and var. eximium.

Cultigens of the species include the following cultivars and clones:

Cl. 'Ace'. A 'Croft' type, but taller with darker green foliage.
Cv. 'Creole'. A selection of var. eximium reported to have originated near New Orleans, Louisiana, where it has been used extensively for the cut flower market.
Cv. 'Croft'. Named for Sydney Croft, of Oregon. A low-growing plant with recurving foliage and the flowers not markedly narrow. It, and clones selected from it, are probably the most commonly grown type for forcing in the United States.
Cv. 'Erabu'. An early-flowering variant, produced largely in Japan. It is named for the island of Erabu, in the northern Ryukyu chain.
Cl. 'Estate'. Introduced by Croft from Oregon, and perhaps a selection of the cultivar named for him. It is of medium height, with short foliage and moderately narrow flowers.
Cv. 'Georgia Belle'. Described as very free-flowering, with the flowers very heavy-textured and pure white.
Cv. 'Howard'. An early flowering selection of var. eximium, originating from Bermuda.
Cl. 'Wonderbell Improved'. A selection from 'Creole', described as producing more flowers per stem and with larger flowers, than does 'Creole'.

Bulbs of the Easter lily, that have been flowered by forcing, may be planted in the garden in protected areas. They are not completely winter-hardy in areas where the ground freezes to depths of six inches or more. When grown in the gardens, they normally flower in early summer, with some flowering as late as July. They do best in a limestone soil.

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Elmer Drew Merrill (1876-1956)

George H. M. Lawrence

In March 1942 it was my privilege to spend a day at the Fairchild Tropical Garden, Coconut Grove, Florida, in the company of great men in the field of horticulture and botany - Liberty Hyde Bailey, David Fairchild, Elmer Drew Merrill, and Walter Dean Swingle. The host was Col. Robert H. Montgomery, himself an ardent champion of their work. For a few hours that day we were joined by Tom Barbour, a colossus in the field of natural history. One by one, the passing of these men has been chronicled in the literature. The last to go was Dr. Merrill, on February 25, 1956.

Elmer Drew Merrill was a botanist foremost and an executive and administrator only secondarily. A native of Maine, he graduated from its University and for two years studied medicine at George Washington University, while working as an agrostologist in the U. S. Department of Agriculture. Botany won over medicine, and Merrill left Washington in 1902 to become Botanist at the new Department of Agriculture in the Philippines, where he remained for twenty-one years.

During his stay in the Philippines, he became head of the botany department of the University of Manila, later Director of the Bureau of Science. By his administrative capacity and talent, he built one of the Orient's most respected strongholds of science. As a taxonomic botanist he made his mark indelible. For all of these years he was an avid student of the flora of the Philippines, and by his infectious enthusiasm for the work he attracted many students, training them to carry on and expand the work. He penetrated forests, swamps, and mountains of every major island of the Archipelago. He became fluent in Spanish and mastered native languages. Anecdotes of his experiences deserve collection and publication, so vividly do they portray the man and his work. He and his workers collected hundreds of thousands of specimens, and built the herbarium at the University of Manila into one of the finest in the Orient. This herbarium provided the documentation of the flora of those islands, the basis of the many books and hundreds of papers Merrill wrote on that flora.

During this time he studied the floras of China, Malaya, and southeast Asia and added thousands of specimens to the Manila herbarium. He became an authority on those floras. At the same time he was a keen student of plant geography, ethnology, and the interrelationship of plants and the people who use them. This breadth made his taxonomic papers the more valuable.

It has been said many times, by many persons, that E. D. Merrill probably knew on sight the names of more kinds of plants

than any other person of his era. The great herbarium built by Merrill at the University of Manila was destroyed during World War II. In the years following, crushed by that loss of his labor, but undefeated, Merrill combed the herbaria of Europe seeking duplicates of earlier collections they had received from him when he was at Manila, from which to rebuild that herbarium.

At the herbarium of the British Museum of Natural History I saw him, in 1950 and again in 1951, going over bundles of unidentified Asiatic collections, naming the specimens as he went from one to the next - this service, in return for withdrawing the duplicates, naming them, and having them shipped to Manila.

On another occasion, at the Arnold Arboretum, I watched him as he stood before a bundle of unnamed plants of eastern Asia, naming a specimen as he looked at it, while his assistant Miss Perry wrote down the name. Bundle after bundle were gone through, with those specimens not named on sight being set aside for analytical study.

Prior to his appointment as Director of the Arnold Arboretum in 1935, he was Director of the New York Botanical Garden. He came to New York in 1930 from California, where for six years he had been Dean of the College of Agriculture at the University of California at Berkeley.

Dr. Merrill was small of stature, a thin man. He thought and spoke so rapidly, it was sometimes difficult to follow him. His eyes were penetrating. His speech was direct, to the point of bluntness. His energy and drive were dynamic. His work was his life. But he was most human, and unlike many botanists he would, for example, set aside this work to listen to a broadcast of a world series baseball game, or to relax over a cup of tea.

For the last two decades, Merrill had been a dominant, highly respected figure in international botanical circles, known personally to hundreds of associates in Europe and in Pan-America, and to most of Asia's pre-war botanists. His botanical work has provided standards of excellence. May those critics who feel he wrote too much too fast remember that his was a most dynamic personality, devoid of indecision, unencumbered by procrastination, and that his productions reflected a massive intellect, a fantastic memory, and a will to accomplish. Another factor to be considered is that he had close access to abundant herbarium material, a background of years of field experience, and almost always had the best of botanical libraries at his side. With these personal attributes, experience, plant materials, and best of facilities, productivity was a natural result.

Elmer Drew Merrill was born in East Auburn, Maine, October 15, 1876, received his B.S. from the University of Maine in 1898, and his M.S. in 1904. Honorary doctorates were awarded him by the Universities of Maine, Harvard, and California. He was honored by botanical societies of four continents. His contributions to botanical science stand as a monument to his memory.

Book Reviews

"The Genus Phlox" by Edgar T. Wherry. (Morris Arboretum Monographs III.) 174 pages, numerous halftones, line-drawings, and maps. Associates of the Morris Arboretum, Philadelphia, 1955. Price: $4.00.

The genus Phlox has long been a taxon of interest both to botanists and to horticulturists. To botanists it is of interest because of the variability of the species in flower structure (some species have styles as long as the corolla-tube, in others the style is only as long as the calyx) and habit, and because of the transcontinental distribution of the genus. To horticulturists it is of interest since it furnishes many taxa of ornamental value, some flowering in early spring, others in the hot, dull days of summer. The genus has been treated systematically by a number of students, the last being the very excellent treatment of August Brand (Polemoniaceæ in A. Engler's "Das Pflanzenreich," Heft 27 [text in German and Latin]) published in 1907. This treatment, however, was probably based almost entirely on herbarium material, and without a comprehensive field knowledge of the taxa. While the key for identification of the taxa is excellent, there has been some criticism of his concepts of the relationship of the taxa, one to another.

For the past twenty-five years or more, Dr. Edgar T. Wherry, Emeritus Professor of Botany at the University of Pennsylvania, has been studying the genus, not only as herbarium material, but as living plants in the field and in the garden. The results of these years of study are presented in this monograph of 174 pages, which presents a revised description of the species as well as a revised systematic arrangement.

It would be pleasant if one could report that this study placed our knowledge of the genus Phlox on a sound footing - but unfortunately this is not the case. The treatment is marred by a number of faults, some of only incidental importance, but others of such proportions as to make the treatment almost useless for all practical purposes.

The book begins with an historical outline of the study, a glossary, and some phytogeographical comments. This phytogeographic commentary contains some interesting thoughts, but so few data are presented that one can hardly judge the validity of the author's conclusions.

One can forgive the author of a monograph a great deal, if, by the use of his work, one can identify unknown taxa. Unfortunately, in this lies the greatest weakness of the present study. While Brand

provided an artificial* key as well as a systematic key to his taxa, Wherry provides us only with a systematic key, many of the leads of which do not seem to be accurate, or to contrast strongly enough to be easily usable. For instance, Wherry has divided the genus into three sections. To separate the first section, Protophlox, from the other two he says, "Styles united for only 1/4 to 1/2 (rarely 5/8) their total length..." However, Wherry's diagrams and the material which I have examined show that the styles in material of this section are united for more than 1/2 their length. Also, the characters which Wherry uses to distinguish the other two sections - habit, leaf size, inflorescence, seed size, and embryo size - all intergrade to such an extent that it is frequently impossible to tell into which section a given specimen should fall.

The keys to the subsections and species present the same difficulties. Of five collections of wild material which I tried to determine (two from the southeastern U. S. and three from the far West), only one was readily identifiable with Wherry's keys. This is in strong contrast to the key provided by Brand, with which this same material was identified with ease. In one case, Phlox speciosa Woodhousei (or P. Woodhousei), the final character in the key in Wherry's monograph (Woody tissue little developed...) is the exact opposite to that given in the same author's treatment of the genus in Kearney and Peeble's "Arizona Flora" (Woody tissue well developed...). This is confusing, to say the least.

The second major fault lies in the nomenclature used. Despite the precise directions of the International Code of Botanical Nomenclature (Art. 34), Wherry has chosen to cite subspecific names in a trinomial combination without interposed indication of rank. Despite his statements as to what he means, on page nine, this practice renders such names illegitimate. Similarly, his citation of an authority for the typical subspecies of a species is not sanctioned by Article 35. Finally, since Article 43, paragraph 2, states, "On and from 1 Jan. 1953 when two or more different names (so-called alternative names) are proposed simultaneously for the same taxon by the same author none of them is validly published," we are left with considerable doubt as to the validity of many of the names which Wherry has published with an "Acceptable Synonym." A case in point concerns the taxon for which Wherry has proposed the name Phlox viridis compacta (p. 87):

> "Comb. nova; proposed for use by workers who favor segregating the glandular and glandless members of the P. longifolia complex at the species level.
> "Acceptable Synonym: P. longifolia compacta Wherry [published previously]."

*An artificial key is one which uses an arbitrary set of key characters which separate out individual taxa without regard for their relationship one to another, whereas a natural or systematic key uses only characters which are supposed to indicate actual relationship, the taxa being separated out in a sequence which is supposed to indicate their relationship one to another.

Another fault appears in the lack of a list of herbarium material which he has seen and worked with. This would have been helpful to other students who might wish to gain some understanding of his concepts of taxa. Also, the citation of natural distribution by the use of township names and geographical coordinates may lend precision to the presentation, but the omission of state and county names is certainly inconvenient unless one has ready access to a complete file, and gazeteer, of the United States Geological Survey maps.

The monograph is printed on paper of good quality, and well bound. The two-column format is not difficult to read. Cultural notes are appended to the descriptions of some species. It is unfortunate that the reproduction of many of the halftone illustrations is muddy.

All in all, this publication does not facilitate identification of taxa within the genus Phlox. For this we must still rely on the monograph of Brand. It is regrettable that Dr. Wherry's great knowledge of the genus remains nearly as inaccessable as it was before.

G. P. DeW.

"Die Nadelgehölze [The Conifers]" by Gerd Krüssmann. 304 pages, 256 halftones, 96 line drawings and maps. Paul Parey, Berlin, 1955. Price: 39.60 Deutschmarks (about $91.10).

This new work by Mr. Krüssmann is a companion volume to his "Die Laubgehölze (reviewed in "Baileya" 3: 192 [Dec., 1951]), which is a manual of cultivated, deciduous woody plants. This is a handsomer volume, however, with its coated-paper pages and numerous fine photographic illustrations and line-drawings. The translation of the title as "The Conifers" is not quite accurate, for the book covers nearly all the gymnosperms, including Taxus, Ephedra, and Cinkgo, but excluding the cycads. Even those taxa which in Germany must be over-wintered under glass are included. The text is in German, of course.

As in the previous volume, the genera, species, and cultivars are arranged alphabetically rather than systematically, and this appears to me to be the best arrangement in a book such as this, which is intended for the horticulturist rather than the botanist. The taxa are briefly described, with occasional remarks on their origins, cultural requirements, or horticultural value. Symbols are used marginally to indicate their relative winter-hardiness, and the relative merit of the most recommended species or cultivars. Although there are no true keys to aid identification, such as are found in Rehder's "Manual of Cultivated Trees and Shrubs," there are useful diagnostic figures, and tables of distinguishing characteristics for many taxa in the larger groups.

Like the other, the volume is largely a compilation from previous literature, though Mr. Krüssmann has travelled widely in Europe and is familiar with many of the described taxa as they are to be found growing under cultivation. In his systematic arrangement of the gymnosperms, he has followed the Swedish botanist, Florin; in nomenclature he has relied chiefly on Rehder's "Bibliography of Cultivated Trees and Shrubs," although, because he accounts for many more taxa than did Rehder there, he has also followed other authorities. The author does not make any attempt to designate the rank of taxa below that of species, for he uses trinomials consistently without indicating whether the taxon is a variety, form, or cultivar. No doubt most of the taxa designated by polynomials here should actually be treated as cultivars. The sesquipedalian, pseudoscientific name Chamæcyparis pisifera plumosa aurea compacta, for instance, would be more acceptable as C. pisifera cv. 'Plumosa Aurea Compacta', but the decision as to just which names should stand in the rank of cultivar would take some study.

For its completeness and helpful descriptions (about 1300 taxa are said to be included) and its good illustrations, this work will be valuable to every nurseryman and arboretum worker who can surmount the slight barrier of language difference. It should not be considered a final authority in the matter of nomenclature, however.

W. J. D.

"Flowers in Colour" by A. G. L. Hellyer. 128 pages, 24 colored plates, many line illustrations. W. H. & L. Collingridge, Ltd., London, and Transatlantic Arts, New York, 1955. Price: 21 shillings ($2.94).

The purpose of this condensed encyclopedia is to "enable many gardeners to acquire a better knowledge of more familiar and important plants." To this end Mr. Hellyer has treated here, quite briefly, about 300 genera of flowering plants commonly cultivated in England in the open or under glass. Included are herbaceous annuals and perennials, shrubs, vines, and small flowering trees.

The organization of the book is quite simple. The various genera are arranged in alphabetical sequence, and each is allotted one to several paragraphs of very readable general description, brief comments on a few representative or outstanding species and varieties, and suggestions on culture. In the broad margins alongside the text are line illustrations of one or more members of the genus, and distributed throughout the book are 24 full-page color plates, each containing figures of a number of additional species. These also are arranged alphabetically according to generic names, so that they are neighboring to the pertinent text.

In general, the nomenclature used is quite acceptable even to the taxonomist, but in a few instances the author has chosen to keep what he calls the "popular" botanical names, "to avoid confusion." Using Cypripedium to cover the genera Paphiopedilum and Phragmipedium as well as true Cypripedium, and the names Arum, Gloxinia, and Montbretia instead of Zantedeschia, Sinningia, and Crocosmia respectively, for example, does not seem "a sensible departure from strictly scientific nomenclature" when the aim is to avoid confusion rather than perpetuate it. Surely, in the interests of accuracy, the accepted valid scientific names ought to be employed for the genera, while arum, gloxinia, montbretia, and cypripedium still may be retained as common or popular names (as zinnia and gladiolus are used). The names Aster, Alyssum, and Spiræa enjoy a certain ambivalence also, as used here.

The full-page plates, from paintings by Cynthia Newsome-Taylor, are accurate in color and usually also in detail, but many of the flowers have a rather disheveled or distorted appearance. Most flowers do have a certain neatness and symmetry in both form and in their arrangement in the inflorescence, but here those flowers which are naturally closely clustered in an inflorescence seem especially to have gotten out of hand, and Miss Newsome-Taylor has not mastered the three-quarter view. The Aquilegia and Lilium candidum particularly have a frowsy, "sat-on" look.

Most of the black-and-white illustrations are enlargements of wood-engravings prepared by James de Carle Sowerby for J. C. Loudon's "Encyclopædia of Plants," first published in 1829. In their original, diminutive form they served fairly well to illustrate many of the thousands of species Loudon accounted for, but, enlarged here 1 1/2 times, they appear somewhat crude, the details often lost in the coarse linear shading. Simple pen-and-ink drawings would be more appropriate illustrations where their function is to familiarize the beginner with unfamiliar plants, and not merely to be quaintly decorative. Incidentally, the figures illustrating Kalmia latifolia and K. angustifolia should be interchanged, as should also those of Cypripedium (=Phragmipedium) caudatum and C. (=Paphiopedilum) barbatum. Also, the figure of Pulmonaria virginica ought not to be used to represent the genus Pulmonaria, since this species is our Virginia Cowslip, Mertensia virginica.

As will be surmised, and as the author intends, the book will be serviceable chiefly to the novice and inexperienced gardener for whom the rich variety of ornamental plants available to him is a treasure-trove still hidden or just being revealed. The experienced gardener will find it perhaps too elementary, but may wish to present it to friends who are susceptible to enticement into the wider fields of horticulture. The expressed aim of the author, to familiarize gardeners with the varied and beautiful flowers now available to them, will best be achieved by their browsing through these pages rather than by their attempting to identify particular unknown material with its aid, however.

W. J. D.

ABBREVIATIONS USED IN BAILEYA

ann.	annual	dm.	decimeter	lf.	leaf
bien.	biennial	fl.	flower	lft.	leaflet
br.	branch	fls.	flowers	lvs.	leaves
brt.	branchlet	flt.	floret	mm.	millimeter
caps.	capsule	fr.	fruit	per.	perennial
cl.	clone	ft.	foot	segm.	segment
cm.	centimeter	hort.	horticultural	st.	stem
cv.	cultivar	in.	inch	sts.	stems
diam.	diameter	infl.	inflorescence	var.	variety

METRIC - ENGLISH EQUIVALENTS (approximate)

6 mm. - 1/4 in.	10 cm. - 4 in.	10 mm. - 1 cm.
12 mm. - 1/2 in.	1 dm. - 4 in.	10 cm. - 1 dm.
25 mm. - 1 in.	3 dm. - 1 ft.	10 dm. - 1 meter
2.5 cm. - 1 in.	10 dm. - 1 yd.	
5 cm. - 2 in.	1 m. - 39 in.	